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(54) **ELECTROMAGNETIC RADIATION
EMITTING TOOTHBRUSH AND
DENTIFRICE SYSTEM**

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(58) **Field of Classification Search** **433/29;**
215/22.1, 105, 167.1; 15/22.1, 105, 167.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,834,344 A 5/1958 Kanai
3,261,978 A 7/1966 Brenman
3,478,741 A 11/1969 Simor
3,520,297 A 7/1970 Bechtold
4,273,535 A 6/1981 Yamamoto et al.

4,502,497 A 3/1985 Siahou
4,661,070 A 4/1987 Friedman
4,779,173 A 10/1988 Carr et al.
4,877,401 A 10/1989 Higuchi et al.
4,890,732 A * 1/1990 Shackelford 206/362.1
4,952,143 A 8/1990 Becker et al.
4,969,868 A 11/1990 Wang
4,983,381 A 1/1991 Torres Zaragoza

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 406 454 1/1991

(Continued)

OTHER PUBLICATIONS

International Preliminary Examination Report, Mar. 15, 2000, PCT/
US98/12836.

(Continued)

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(57) **ABSTRACT**

A device includes a handle coupled with an activated textured
surface that can be implemented using a repetitive movement
mechanism and a treatment energy source, such as an elec-
tromagnetic radiation source. The handle may be used to
provide detection, treatment and/or management of sundry
conditions including, for example, tooth discoloration, tissue
damage, periodontal disease, tumors, pain, halitosis, and
bronchitis. The activated textured surface may include a sur-
face topography including corrugations, bristles, protuber-
ances, or pits, or other surfaces for facilitating agitation,
cleaning or other surface treatments.

34 Claims, 9 Drawing Sheets

